CLAIMS

1. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises at least one modified pigment product comprising a pigment having attached at least one organic ionic group and at least one amphiphilic counterion, wherein said amphiphilic counterion has a charge opposite to that of the organic ionic group.

2. The printing plate of claim 1, wherein the organic ionic group is an anionic group and wherein the amphiphilic counterion is a cationic amphiphilic counterion.

3. The printing plate of claim 2, wherein the anionic group comprises a carboxylate group or a sulfonate group.

4. The printing plate of claim 2, wherein the anionic group is an anion derived from a substituted or unsubstituted carboxyphenyl or a substituted or unsubstituted sulfophenyl group.

5. The printing plate of claim 2, wherein the cationic amphiphilic counterion comprises an ammonium group.

6. The printing plate of claim 2, wherein the cationic amphiphilic counterion is an ion represented by the formula R_4N^+, wherein R is independently hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkaryl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted alkenyl group.

7. The printing plate of claim 2, wherein the cationic amphiphilic counterion is a quaternary ammonium ion.

8. The printing plate of claim 2, wherein the cationic amphiphilic counterion is a benzyltrialkyl ammonium ion.

9. The printing plate of claim 2, wherein the anionic group comprises a carboxylate group and the cationic amphiphilic counterion is a benzyltrialkyl ammonium ion.

10. The printing plate of claim 1, wherein the organic ionic group is a cationic group and wherein the amphiphilic counterion is an anionic amphiphilic counterion.

11. The printing plate of claim 10, wherein the cationic group comprises an ammonium group.

12. The printing plate of claim 10, wherein the cationic group is $-C_6H_4-NC_5H_5^+$.

13. The printing plate of claim 10, wherein the cationic group is $-C_5H_4^+N-R$, wherein R is an alkyl group, an aryl group, an alkaryl group, an aralkyl group, or an alkenyl group.

14. The printing plate of claim 10, wherein the anionic amphiphilic counterion is an ion comprising at least one carboxylate group or sulfonate group.

15. The printing plate of claim 10 wherein the anionic amphiphilic counterion is an alkyl carboxylate ion.

16. The printing plate of claim 1, wherein the radiation-absorptive layer further comprises a polymer.

17. The printing plate of claim 16, wherein the polymer is a phenolic polymer.

18. The printing plate of claim 17, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

19. The printing plate of claim 16, wherein the polymer is an acrylic polymer.

20. The printing plate of claim 19, wherein the acrylic polymer is a polymer comprising acrylic acid, methacrylic acid, or salts thereof.

21. The printing plate of claim 1, wherein the substrate is a hydrophilic metal substrate.

22. The printing plate of claim 1, wherein the substrate is aluminum or polyester.

23. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises a phenolic polymer and at least one modified pigment product.

24. The printing plate of claim 23, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

25. The printing plate of claim 23, wherein the modified pigment product comprises a pigment having attached at least one organic group.

26. The printing plate of claim 25, wherein the organic group comprises at least one ionic group, at least one ionizable group, or a mixture thereof.

27. The printing plate of claim 25, wherein the organic group comprises an anionic group.

28. The printing plate of claim 25, wherein the organic group comprises a carboxylic group, a sulfonate group, or salts thereof.

29. The printing plate of claim 25, wherein the organic group is a carboxyphenyl group, a sulfophenyl group, or salts thereof.

30. The printing plate of claim 25, wherein the organic group comprises a cationic group.

31. The printing plate of claim 25, wherein the organic group comprises an ammonium group.

32. The printing plate of claim 25, wherein the organic group is $-C_5H_4^+N-R$ with a counterion, wherein R is an alkyl group or an aromatic group.

33. The printing plate of claim 32, wherein R is a methyl group or a benzyl group.

34. The printing plate of claim 23, wherein the substrate is a hydrophilic metal substrate.

35. The printing plate of claim 23, wherein the substrate is aluminum or polyester.

36. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises a phenolic polymer and at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-$[A]_pR$, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, A represents an alkylene oxide group of from about 1 to about 12 carbons, p is an integer of from 1 to 500, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, wherein A can be the same or different when p is greater than 1.

37. The printing plate of claim 36, wherein A is $-CH_2-CH_2-O-$, $-CH(CH_3)-CH_2-O$, $-CH_2-CH(CH_3)-O$, $-CH_2-CH_2-CH_2-O-$, or combinations thereof.

38. The printing plate of claim 36, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

39. The printing plate of claim 36, wherein the substrate is a hydrophilic metal substrate.

40. The printing plate of claim 36, wherein the substrate is aluminum or polyester.

41. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises an acrylic polymer and at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-$[A]_pR$, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, A represents an alkylene oxide group of from about 1 to about 12 carbons, p is an integer of from 1 to 500,

and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, wherein A can be the same or different when p is greater than 1.

42. The printing plate of claim 41, wherein A is $-CH_2-CH_2-O-$, $-CH(CH_3)-CH_2-O$, $-CH_2-CH(CH_3)-O$, $-CH_2-CH_2-CH_2-O-$, or combinations thereof.

43. The printing plate of claim 41, wherein the acrylic polymer is a polymer comprising acrylic acid, methacrylic acid, or salts thereof.

44. The printing plate of claim 41, wherein the substrate is a hydrophilic metal substrate.

45. The printing plate of claim 41, wherein the substrate is aluminum or polyester.

46. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-[Vinyl]R, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, Vinyl represents an acrylic or styrenic homo- or copolymer comprising repeating substituted or unsubstituted acrylic or styrene monomer units, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group.

47. The printing plate of claim 46, wherein Vinyl is an acrylic or methacrylic acid homo- or copolymer, or salt thereof.

48. The printing plate of claim 46, wherein Vinyl is an acrylic or methacrylic ester.

49. The printing plate of claim 46, wherein the radiation-absorptive layer further comprises a polymer.

50.. The printing plate of claim 49, wherein the polymer is a phenolic polymer.

51. The printing plate of claim 50, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

52. The printing plate of claim 49, wherein the polymer is an acrylic polymer.

53. The printing plate of claim 52, wherein the acrylic polymer is a polymer comprising acrylic acid, methacrylic acid, or salts thereof.

54. The printing plate of claim 46, wherein the substrate is a hydrophilic metal substrate.

55. The printing plate of claim 46, wherein the substrate is aluminum or polyester.

56. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-[EI]R, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, EI represents an alkyleneimine-based polymer or copolymer, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group.

57. The printing plate of claim 56, wherein EI is polyethyleimine or derivatives of polyethyleneimine.

58. The printing plate of claim 56, wherein the radiation-absorptive layer further comprises a polymer.

59. The printing plate of claim 58, wherein the polymer is a phenolic polymer.

60. The printing plate of claim 59, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

61. The printing plate of claim 58, wherein the polymer is an acrylic polymer.

62. The printing plate of claim 61, wherein the acrylic polymer is a polymer comprising acrylic acid, methacrylic acid, or salts thereof.

63. The printing plate of claim 56, wherein the substrate is a hydrophilic metal substrate.

64. The printing plate of claim 56, wherein the substrate is aluminum or polyester.

65. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-[SMA]R, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, SMA represents a styrene-maleic anhydride polymer or derivative, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group.

66. The printing plate of claim 65, wherein SMA is styrene-maleic anhydride or derivatives of styrene-maleic anhydride.

67. The printing plate of claim 65, wherein the radiation-absorptive layer further comprises a polymer.

68. The printing plate of claim 67, wherein the polymer is a phenolic polymer.

69. The printing plate of claim 68, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

70. The printing plate of claim 67, wherein the polymer is an acrylic polymer.

71. The printing plate of claim 70, wherein the acrylic polymer is a polymer comprising acrylic acid, methacrylic acid, or salts thereof.

72. The printing plate of claim 65, wherein the substrate is a hydrophilic metal substrate.

73. The printing plate of claim 65, wherein the substrate is aluminum or polyester.

74. A printing plate comprising: a) a substrate and b) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises at least one modified pigment product comprising a pigment that is at least partially coated with one or more polymeric coatings.

75. The printing plate of claim 74, wherein the polymeric coating comprises an acrylic or styrenic polymer.

76. The printing plate of claim 74, wherein the radiation-absorptive layer further comprises a polymer.

77. The printing plate of claim 76, wherein the polymer is a phenolic polymer.

78. The printing plate of claim 77, wherein the phenolic polymer is a homopolymer or copolymer of an hydroxystyrene or a phenol-formaldehyde polymer.

79. The printing plate of claim 76, wherein the polymer is an acrylic polymer.

80. The printing plate of claim 79, wherein the acrylic polymer is a polymer comprising acrylic acid, methacrylic acid, or salts thereof.

81. The printing plate of claim 74, wherein the substrate is a hydrophilic metal substrate.

82. The printing plate of claim 74, wherein the substrate is aluminum or polyester.

83. The printing plate of claim 1, wherein the radiation absorbed by the radiation-absorptive layer is infrared or near-infrared.

84. The printing plate of claim 1, wherein the pigment is carbon black, graphite, vitreous carbon, finely-divided carbon, activated carbon, activated charcoal, or mixtures thereof.

85. The printing plate of claim 1, wherein the pigment is carbon black.

86. The printing plate of claim 1, wherein the pigment comprises a white pigment, a black pigment, a blue pigment, a brown pigment, a cyan pigment, a green pigment, a violet pigment, a magenta pigment, a red pigment, a yellow pigment, shades thereof, or combinations thereof.

87. The printing plate of claim 17, wherein the organic group is a dissolution inhibitor of the phenolic polymer.

88. The printing plate of claim 17, wherein the amphiphilic counterion is a dissolution inhibitor of the phenolic resin.

89. The printing plate of claim 87, wherein the organic group is chemically transformed by an IR laser.

90. The printing plate of claim 88, wherein the amphiphilic counterion is chemically transformed by an IR laser.

91. A method of imaging the printing plate of claim 1, comprising selectively exposing the plate to a laser output in a pattern representing an image to selectively remove or chemically modify at least the radiation-absorptive layer.

92. The method of claim 91, further comprising subjecting the plate to a solvent capable of removing portions of the imaged layer(s).

93. A flexographic printing plate comprising: a) a substrate, b) a UV curable layer, and c) a radiation-absorptive layer, wherein the radiation-absorptive layer comprises at least one modified pigment product.

94. The flexographic printing plate of claim 93, wherein the radiation-absorptive layer further comprises a polymer.

95. A thermal transfer recording material comprising: a) an ink layer, b) a photothermal layer, and c) a support, wherein the photothermal layer comprises at least one modified pigment product.

96. The thermal transfer recording material of claim 95, wherein the photothermal layer further comprises a polymer.

97. A proofing material comprising: a) a radiation transparent support, b) a radiation curable layer, and c) a receiving layer, wherein the radiation curable layer comprises at least one modified pigment product.

98. The proofing material of claim 97, wherein the radiation curable layer further comprises a polymer.

99. A black matrix formed by applying a photosensitive coating on a clear substrate, exposing the coating imagewise, and developing and drying the coating, wherein the photosensitive coating comprises at least one modified pigment product comprising a pigment having attached at least one organic ionic group and at least one amphiphilic counterion, wherein said amphiphilic counterion has a charge opposite to that of the organic ionic group, and a solvent.

100. The black matrix of claim 99 further comprising a photosensitive resin.

101. A black matrix formed by applying a photosensitive coating on a clear substrate, exposing the coating imagewise, and developing and drying the coating, wherein the photosensitive coating comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-$[A]_pR$, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, A represents an alkylene oxide group of from about 1 to about 12 carbons, p is an integer of from 1 to 500, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, wherein A can be the same or different when p is greater than 1.

102. The black matrix of claim 101 further comprising a photosensitive resin.

103. A black matrix formed by applying a photosensitive coating on a clear substrate, exposing the coating imagewise, and developing and drying the coating, wherein the photosensitive coating comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-[Vinyl]R, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, Vinyl represents an acrylic or styrenic homo- or copolymer comprising repeating substituted or unsubstituted acrylic or styrene monomer units, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group.

104. The black matrix of claim 103 further comprising a photosensitive resin.

105. A black matrix formed by applying a photosensitive coating on a clear substrate, exposing the coating imagewise, and developing and drying the coating, wherein the photosensitive coating comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-[EI]R, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, EI represents an alkyleneimine-based polymer or copolymer, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group.

106. The black matrix of claim 105 further comprising a photosensitive resin.

107. A black matrix formed by applying a photosensitive coating on a clear substrate, exposing the coating imagewise, and developing and drying the coating, wherein the photosensitive coating comprises at least one modified pigment product comprising a pigment having attached at least one organic group represented by the formula -X-Sp-[SMA]R, wherein X, which is directly attached to the pigment, represents an arylene, heteroarylene, or alkylene group, Sp represents a spacer group, SMA represents a styrene-maleic anhydride polymer or derivative, and R represents hydrogen, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group.

108. The black matrix of claim 107 further comprising a photosensitive resin.

109. A black matrix formed by applying a photosensitive coating on a clear substrate, exposing the coating imagewise, and developing and drying the coating, wherein the photosensitive coating comprises at least one modified pigment product comprising a pigment that is at least partially coated with one or more polymeric coatings.

110. The black matrix of claim 109 further comprising a photosensitive resin.